

**Abstract**

A multiband OFDM\_UWB transmitting and receiving apparatus is provided in Low-IF configuration to solve problems attributed to a direct-conversion transmitting and receiving apparatus. A Low-IF receiver performs sorting by rotating a sub-carrier after FFT to eliminate the need for frequency conversion using a second local signal and uses the same AD conversion clock as that for a direct conversion receiver. An FFT-free preamble can be detected by using a sequence resulting from previously multiplying an original preamble pattern and an IF frequency together.